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Safety and Environmental Regulation in Industrial Mobilization

William E. Durrwachter
Donald A. Kane
James E. Thompson, Jr.

An Industrial College of the Armed Forces Study
in Mobilization and Defense Management

National Defense University

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CONTENTS

Foreword ix
Acknowledgements xi

Introduction 3

1. OSHA and EPA: Yesterday, Today, and Tomorrow ... 9
   The Occupational Safety and Health Administration 9
   The Environmental Protection Agency 11
2. The Nature of OSHA and EPA Costs 17
3. OSHA– and EPA–Related Costs 27
   OSHA-Related Costs 27
   EPA-Related Costs 31
4. Department of Defense Position 37
5. Impact of OSHA and EPA on Industrial Mobilization .. 47

Conclusions 53
Recommendations 55

Appendixes

A. Research Project Note–Taking Guide 59
B. Views of Industrial Trade Associations 61
C. General Dynamics—A Corporate View 63
D. McDonnell–Douglas Corporation 67

E. General Dynamics, Electric Boat Division, Groton, CT 71
F. Supervisor of Shipbuilding, Groton, CT 75
G. Norfolk Naval Shipyard, Portsmouth, VA 77
References Cited 81
The Authors 87

Tables

1–1 Expiration dates of key environmental acts 13
4–1 Waivers from environmental regulation 42

FOREWORD

A STRONG DEFENSE requires national decisionmakers to consider a host of tradeoffs, including choices which affect the natural environment and the safety and health of the country's population. Americans long have been concerned with conditions prevailing in their places of work and leisure. Today, Americans are more aware than ever that unthinking application of technology can erode, rather than improve, the quality of life.

When the industries that threaten such erosion are related to national security, should we insist on the same strict standards as we now do with non-defense industries? Preventing pollution or injury can at the same time, say some experts, slow production, raise costs, lower product quality. If safety and health factors create dilemmas for US industry during peacetime production, what actions should the country take when a national emergency calls for accelerated production? What policies, laws, regulations, and procedures should we adopt to maintain an adequate industrial base for mobilization and at the same time protect the health and environment of our citizens?

To address these questions, the Industrial College of the Armed Forces sponsored the study before you. The authors, probing a subject that has been somewhat neglected, have sought ways to build a sufficient industrial mobilization base without simultaneously sacrificing the nation's safety, health, and environment.

C. D. DEAN
Major General, US Marine Corps
Commandant, Industrial College
of the Armed Forces

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Safety and Environmental Regulation in Industrial Mobilization

INTRODUCTION

"As for defense, frankly, we are not doing well and if this nation wants an adequate defense industrial base over the next decade and beyond, some things will have to be turned around—and soon" (1:1).*

"... pollution control regulations have clearly led to the early retirement of many facilities that had been marginally economic earlier, but that did not justify the additional investment associated with compliance" (2:378).

"Many of the bottlenecks [to surge capability] have resulted from the closure of forging and casting facilities and the lack of construction of new facilities. During the 1970's, literally hundreds of foundries closed as a result of environmental, health and safety laws and regulations imposed by the Federal Government" (3:13).

"... frequently OSHA standards speed up the normal replacement cycles and cause the industry to install a possibly more productive and competitive technology than it was using previously" (4:24).

"Much of the rhetoric surrounding the topic of the increasing amount of government regulation in the United States has been misdirected" (5:57).

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*These figures refer to references cited throughout this study; see the References Cited section on page 81. The first number refers to the publication; the second number refers to a specific page or pages.

THE PROBLEM

THE DIVERGENT VIEWPOINTS REPRESENTED by the above quotes underscore the need for a comprehensive review of the impact of the Occupational Safety and Health Act, the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) on costs and performance of major defense contractors in the event of industrial mobilization. Such a study of today's impact would have its own intrinsic value; but, more importantly, the study should address the future. How will OSHA and EPA affect the capability of the defense industry to surge production in peacetime, or to mobilize in the event that war clouds gather? How significant is this impact? How do the future OSHA and EPA impact on surge or industrial mobilization compare with other recognized limitations, such as a shrinking industrial base and a reluctance of many firms to seek out defense business? When these "how" questions are answered, plans and programs can be designed and evaluated to mitigate the impact of OSHA and EPA on industrial mobilization.

Evaluating these "how" questions is not easy, because no clear consensus exists in the United States on the real impact of OSHA and EPA on American industry and society. Consequently, any study of the impact of OSHA and EPA on industrial mobilization first must examine their impact on today's industry and the societal expectations they have created. This study is designed to provide just such an evaluation and to suggest extrapolation of these findings to future surge or industrial mobilization efforts.

THE HYPOTHESES

THE HYPOTHESES ESTABLISHED by the Industrial College of the Armed Forces were in response to the wide range of opinions expressed in the press, current literature, and even in congressional documents on the impact of OSHA and EPA (3:13). The open-ended hypotheses are as follows:

> It is hypothesized that EPA and OSHA regulations have substantially added to the costs of weapon systems and have delayed the completion of defense contracts. It is also hypothesized that these regulations will inhibit the capability

of the affected contractors to surge in response to a national emergency. The study will either prove or disprove these hypotheses. If the hypotheses are substantiated, the study will identify regulations that are counterproductive and will recommend remedial action, such as temporary suspension during industrial mobilization and war or their repeal or amendment.

METHODOLOGY

THE FIRST PHASE OF THE RESEARCH was an extensive literature search on the topic to separate fact from opinion. Special emphasis was placed on obtaining hard evidence of the extent of financial impact of OSHA and EPA.

Interviews with Government officials and representatives of industrial associations comprised the **second phase**. A note-taking guide used in these sessions is included here as appendix A. This effort was designed to ascertain current perceptions of OSHA and EPA and to see whether these beliefs could be substantiated. During this phase, Department of Defense (DOD) officials were interviewed for their plans for addressing the specifics of OSHA and EPA impact in the event of mobilization.

The **final phase** of the study constituted visits with corporate officials charged with day-to-day administration of OSHA and EPA programs at their corporate headquarters, regional offices, and individual plants and factories. These interviews were intended to determine supervisor and worker perceptions and expectations of OSHA and EPA today and in the event of a production surge dictated by industrial mobilization.

1

OSHA and EPA: Yesterday, Today, and Tomorrow

THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

On December 29, 1970, The Congress Enacted Public Law 91-576, the Occupational Safety and Health Act of 1970. This Act created the Occupational Safety and Health Administration (OSHA) within the Department of Labor. The mission of OSHA is "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources ..." (6:1). With minor exceptions, all employers and employees in the 50 states, the District of Columbia, Puerto Rico, and all other territories under Federal jurisdiction are governed by this act.

Specifically, OSHA is charged with reducing workplace hazards, providing for research in occupational safety and health, establishing separate but dependent responsibilities and rights for employers and employees, maintaining a reporting and recordkeeping system that monitors job-related injuries and illnesses, establishing training programs, and developing mandatory job-safety and health standards. (7:2).

These objectives are accomplished through 10 regional offices. States are urged to develop and enforce their own job-safety and health programs. If a State's plan is approved by OSHA, OSHA pays the State up to 50 percent of the program's operating cost. As of 1982 21 State programs have been certified by OSHA. This certification is a necessary prerequisite for a State to operate its own program (8:2).

The American labor force has recognized the need for OSHA in response to realities such as high on-the-job accident rates, cotton-dust problems, and carcinogen hazards. About 200,000 fewer job-related injuries occurred in 1981 than in 1980. Fewer than 100,000 injuries serious enough to warrant time away from work were reported; and illness dropped markedly during the same period (9:1). This success rate indicates that OSHA finally has reversed the accident-and-illness trend that had risen since 1965 (10:76,78).

The Occupational Safety and Health Act in itself may not be an issue in the event of industrial mobilization. This Act also empowers the Secretary of Labor to grant "reasonable variations, tolerances, and exemptions to and from any or all provisions of this Act as he may find necessary and proper to avoid serious impairment of the national defense. Such action shall not be in effect for more than six months without notification to affected employees and an opportunity being afforded for a hearing" (6:17). However, doubt exists that such a waiver would be effective, since OSHA regulations are now a well-established part of the American working environment.

* * * * *

Rules and regulations enacted by OSHA over the years largely have been accepted by American society. The labor force feels that its best interests—safety and health—are being protected by OSHA. Conversely, industry feels that some of the laws are too stringent, unnecessary, and possibly being abused by labor (appendix B). In this constant debate over interpretation of the Occupational Safety and Health Act of 1970 and the laws that have followed, OSHA is more dedicated to the refinement of its positions than to the creation of new rules and regulations. OSHA is in a reactive mode and is making every attempt to prepare and research new standards carefully (11). This orientation is evidenced by OSHA's fiscal 1983 objectives, which emphasize stronger management, extended employer and employee assistance, more effective State programs, and the improvement of Federal agency programs (12:1).

OSHA has made considerable progress during the past few years. This progress is evidenced in overall Agency management, reduction of paperwork, development of standards,

enforcement of regulations, and progress with State programs (8:1,3). These accomplishments are impressive, but the continuing need to assure employee safety and health also is evident.

THE ENVIRONMENTAL PROTECTION AGENCY

In An Effort To Achieve A Cleaner and healthier environment in the United States, the Environmental Protection Agency (EPA) was established. Through an executive reorganization plan, a number of Federal environmental activities were consolidated into this single agency. The plan (Reorganization Plan Number 3 of 1970) was approved by President Nixon on July 9, 1970. EPA was established by the Congress as an independent agency in the Executive Branch on December 2, 1970 (13:3).

Creation of the Environmental Protection Agency evolved from a series of Federal environmental laws enacted as early as the 1800s. The Rivers and Harbors Appropriation Act of 1899 prohibited waste discharges into US navigable waters, unless permits were granted by the US Army Corps of Engineers. This permit system later was incorporated into the present National Pollutant Discharge Elimination System (NPDES) permit system (14:81). The Public Health Service Act of 1912 authorized the investigation of water pollution when it affects human health. After the passage of the Oil Pollution Act of 1924, environmental concerns lay dormant until 1948, when the first Federal water-pollution law was enacted. In 1955 Federal funds first were appropriated to begin studying air-quality problems. The first Clean Air Act was passed in 1963; it was amended in 1965, 1967, 1970, and again in 1977 (14:22).

Until the 1970s, the Federal role generally had been limited to management of public lands, waterways, and natural re-

sources. The National Environmental Policy Act (NEPA) was signed into law on 1 January 1970. This law effectively summarized the national concern for environmental protection and mandated that environmental factors be considered at every level of Federal decisionmaking. NEPA requires that when a major Federal action is contemplated, a detailed analysis of the environmental impact of that action be prepared. The product, an environmental impact statement (EIS), is available for review by the President, Federal agencies, and the public (14:152).

EPA was formed from 15 components of the Department of Health, Education, and Welfare (now Department of Health and Human Services), Department of the Interior, Department of Agriculture, Food and Drug Administration, and Atomic Energy Commission. This single agency now is responsible for air-pollution control, solid-waste management, the drinking water program, the Federal water-pollution control program, registration and regulation of pesticides, and radiation-protection standards. Through the enactment of major new environmental laws and amendments to older laws, EPA now administers eight comprehensive environmental protection laws.

This agency is directed by an Administrator and a Deputy Administrator, both appointed by the President. In addition, the President appoints each of the six Assistant Administrators responsible for implementation and enforcement of environmental laws, performance of environmental research and development, and management of EPA.

Agencywide functions are administered through 10 regional staff offices. These offices handle resource management, legal counsel, and enforcement of EPA regulations. The offices of Administrative Law Judges, Civil Rights, Small and Disadvantaged Business Utilization, Science Advisory Board, Intergovernmental Activities, and Federal Activities located in Washington, D.C., assist the entire EPA organization. In addition, three environmental monitoring laboratories and 11 environmental research laboratories are located throughout the United States (13:5).

* * * * *

EPA faces problems of a different nature. Since late 1982 EPA has been faced with allegations of wrongdoing by Agency management. These charges are compounded by the appearance of political manipulation of agency programs and conflicts of interest. These current events led some people to question the ability of the EPA to provide cost-effective protection to the environment (15).

Doubts of the effectiveness of the EPA are further kindled by continuing debates between the administration and the Congress on renewal of the key acts shown in table 2-1.

Table 1-1
Expiration dates of key environmental acts

Act	Expiration Date
Noise Control Act	9/30/79
Clean Air Act	9/30/81
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)	9/30/81
Clean Water Act	9/30/82
Ocean Dumping	9/30/82
Solid Waste and Resources Conservation and Recovery Act (RCRA)	9/30/82
Safe Drinking Water Act	9/30/82

In addition, authorization for research and development by the EPA expired September 30, 1982. Although the acts shown in table 3-1 and authorization for research and development have expired, EPA continues to function within severe budgetary constraint (16).

EPA's future effectiveness depends largely on resolving these issues. Public opinion largely supports the EPA's goal to reduce harmful effects of pollution on human health and the environment. The true financial costs to industry and society, however, currently are in doubt.

2

The Nature of OSHA and EPA Costs

ALTHOUGH OSHA AND EPA DID NOT COME INTO BEING until 1970, the defense industry—with the rest of American industry—experienced environmental, health, and safety costs as early as 1908 (10:12). In the early part of this century, problems involving environmental damage and health-and-safety issues were serious enough to receive national attention and resulted in legislation to bring about change. Particular problems, however, resulted in very specific legislation rather than in broad programs.

In health-and-safety areas, child-labor problems brought on Child Labor Laws; radiation problems helped create the Atomic Energy Act of 1954; increases in construction injuries led to the Construction Safety Act of 1962; and the Federal Coal Mine Health and Safety Act of 1969 followed well-publicized coal-mine accidents (17:9).

In environmental areas, the same "specific-legislation-for-specific-problems" approach was used. The Federal Water Pollution Control Act of 1948 was enacted in response to a well-publicized series of pollution disasters. The Safe Drinking Act of 1974 was driven by the discovery of carcinogenic chemicals in chlorinated drinking water in New Orleans in the early 1970s. Many cities and States had Clean Air Acts on the books as early as the 1940s in response to air-pollution disasters, such as the one that occurred in Donora, PA. Recognition of air-pollution problems made St. Louis homeowners and industries switch from coal to oil and natural gas. Denver banned home and business trash incinerators for the same reason (14:9,10).

In addition to legislative responses to specific problems, other events that predated OSHA and EPA standards had a cost impact on American industry. The first workmen's compensation act came into being in 1908. In 1911 the first State workmen's compensation law was enacted, whereas the last State waited until 1948 to pass one (10:13). Although the original intent of the 1908 law was to apply it to Government employees, it quickly

was adopted for private industry. In 1936 the Public Contracts Act, known as the Walsh-Healey Act, was passed primarily to set wages and maximum work hours after the National Industrial Recovery Act of 1933 was declared unconstitutional. Its secondary purpose was to enforce health-and-safety regulations on holders of Government contracts of $10,000 or more. Wage-and-hour mechanisms subsequently were thrown out, but the health-and-safety features remained in force. In fact, the Secretary of Labor issued the first uniform code of health-and-safety standards (the forerunner of OSHA standards) under the Walsh-Healey Act in the late 1950s (18:102)

In the environmental arena, the Water Pollution Control Administration was created in 1948. It was given a mandate to coordinate and standardize water-pollution criteria, evaluation techniques, and research in environmental areas. As a consequence, States, cities, and other municipal agencies began to set stricter standards for receiving water; they also placed limits on industrial pollutant concentrations (pretreatment standards) for companies using public wastewater treatment facilities. The US Public Health Service promulgated drinking-water standards, and air-pollution standards also were established.

Regardless of the specific cause or sequence of events, American industry has a long history of paying for environmental and workplace health-and-safety measures. Some of these costs resulted from specific dictates of a Government agency. Others were in recognition of social responsibilities (wastewater treatment, for example) or in response to basic economics of the situation (such as safety glasses and safety shoes). For these reasons, the total cost of environmental and health standards is difficult to establish, because they have been adopted over a long period and have received different accounting treatment over the years.

Before the establishment of EPA and OSHA, private agencies set health and environmental standards. Health-and-safety standards were offered as consensus codes by a variety of industrial organizations. These included the American Standards Association (ASA), American Society of Mechanical Engineers (ASME), National Fire Protection Association (NFPA), National Board of Fire Underwriters (NBFU), and American National

Standards Institute (ANSI) (19:15). These codes were adopted voluntarily by American industry in an attempt to codify health-and-safety features and serve as a basis for product comparison and reliability. These standards dictated requirements ranging from electric wiring to toilet-seat design. They were not mandatory, however, and were adopted only where common sense and good practice dictated. Environmental areas had similar standards, especially in engineering design and pollution-control evaluation. These standards represent another layer of environmental and health costs responsibly accepted by industry long before the existence of OSHA or EPA.

When OSHA and EPA started to set standards, Executive Orders directed Federal agencies to take the lead and set examples of compliance with standards. This procedure had a direct and expensive impact on Federal agencies, especially the Department of Defense (DOD). DOD was directed to provide funds for meeting all OSHA and EPA standards or their equivalents. However, these Executive Orders also affected defense contractors when they were worked into the Defense Acquisition Regulation (DAR). In addition, these Executive Orders directed DOD to upgrade Government-owned-and-contractor-operated (GOCO) facilities to comply with all applicable standards (10:63). Although this requirement dealt mostly with capital costs, it did involve operating costs, which were the contractor's responsibility. The result was to pass mandatory costs on to industry. But these costs were not always recognized in the accounting procedures as total environmental and health costs or as incremental costs (10:64,65). Thus, these costs were real, yet difficult to trace and categorize.

In the beginning, OSHA promulgated a whole host of standards by adopting as consensus standards most of the voluntary standards then in existence (ANSI and NFPA standards, for example). These standards affected the broad spectrum of American industry. As OSHA matured, the agency began to issue specific standards that affected particular industries. The cotton-dust standard hit the textile industry; the asbestos standard hit the construction and shipbuilding industries (retrofit); and the benzene standard primarily affected the chemical industry. Tracing the effects of these standards on other industry groups, such as defense-industry contractors, became difficult. This factor is an-

other reason for the difficulty of identifying and quantifying defense-weapon-system costs directly attributable to OSHA or EPA.

EPA environmental regulations and standards, unlike OSHA standards, largely were geographically specific; only to a lesser degree were they specific to any particular industry or process. Although air- or water-pollution standards were common to all facilities emitting a specific pollutant, the location ultimately determined the required standards. If a particular watershed (river, lake, or estuary) or air-quality area (valley or Los Angeles basin, for example) was experiencing serious environmental degradation, standards were set at whatever level was required to correct that particular problem. In areas not experiencing serious environmental problems, standard-setting was based not on correcting problems but on protecting the existing clean environment. This latter reasoning set the stage for the "no-significant-additional-deterioration" air-quality standards for regions enjoying excellent air quality, such as the Grand Teton-Yellowstone region (14:22). In addition, the EPA is divided into 10 regions that promote standards reflecting desires and life styles of the people in those areas (13:4,5). This reason is why water-quality standards in the Pacific Northwest are much more stringent than those in the industrial Northeast. Two identical manufacturing plants in different parts of the country, therefore, could experience vastly different EPA-related environmental costs. In addition, these plants could differ widely as to capital versus operating costs. These factors contribute to the difficulty of identifying and tracking environmental costs levied against defense industries.

Capital and operating costs were mandated by OSHA and EPA. For OSHA, about 29 percent of total expenditures was for capital costs, and 71 percent was for operating and maintenance costs in 1972. In 1981 that split had changed very little at 27 and 73 percent, respectively (20:8). For EPA requirements, data available for 1979 indicate that 52 percent of total cost went for capital expenditures and 48 percent for operations and maintenance (21:24). This difference between OSHA and EPA cost structure is to be expected. The bulk of the OSHA impact is procedural and related to health-and-safety programs, while the

EPA impact relates to industrial processes and is tied to facilities.

Although this study deals with the impact of both OSHA and EPA on defense industries, cost data for these two agencies usually are reported separately after collection by different methods. Consequently, reliable data on both OSHA and EPA is difficult to obtain because they are broken down into annual capital costs and operating costs, and total and incremental costs collected by the same source and by the same method. McGraw-Hill, for example, publishes past and current data on pollution-control capital expenditures but not on operating costs. McGraw-Hill reports OSHA costs for both capital and operating costs separately (22:2). The Council on Environmental Quality (CEQ) reports EPA-related costs on a total basis, including research and development and the EPA yearly budget (23:239). The US Department of Commerce reports only total annual pollution-control capital costs for pollution abatement (24:50;25:17). The Office of Management and Budget (OMB) and the General Accounting Office (GAO) have estimates for the total combined costs of regulation, including EPA and OSHA, and at least four other regulatory organizations (26:32;27:12).

A review of journals and association publications reveals many general statements to the effect that EPA and OSHA regulatory burdens are enormous and growing. Industrial organizations often claim that if OSHA and EPA could be rolled back, productivity and profitability would increase and industrial capacity would return to former levels. Conspicuously absent from these allegations are supporting cost data. Occasionally, figures of the CEQ, the Department of Commerce, or McGraw-Hill are offered in evidence; but often the authors specify that the cost figures are incremental, total, capital, or operating costs, when in fact the original report cataloged them otherwise. In short, the few cost estimates available are overused, abused, or misstated. Proponents and opponents of OSHA and EPA are unable to debate, using accepted facts and figures. Instead, they make their arguments with generalities.

What *are* the costs of OSHA and EPA to American industry? For OSHA, industry experiences about a 30–70 split between capital costs and operating costs (28:5). Through the 1970s, on

average, OSHA-like programs accounted for about 2 percent of capital costs for industry as a whole. In 1981 that percentage dropped to 1.5 percent of capital costs and is expected to average about 1.3 percent through 1984 (20:1,3). Survey projections from this study suggest that real health-and-safety spending will decline rapidly in the out years. This estimate reflects the belief that the present Administration will continue its pressure against the rise in Government regulation, plus the fact that much of the OSHA-driven retrofit is now history.

Another way to look at overall OSHA-related costs is in terms of loss of productivity. A special study by Brookings Institution economist Edward Denison indicates that the actual reduction in productivity due to environmental health costs from 1967 through 1975 is much lower than previously believed. Denison found that productivity dropped by only 0.42 percent because of health-and-safety regulations (4:24). Components of the 0.42 percent consisted of 0.09 percent for auto safety, 0.24 percent for mine safety, and only 0.09 percent attributable to OSHA.

EPA costs to American industry have been estimated at about 1 to 3 percent of capital costs, and have varied over time and as new laws and regulations have come on stream (29:27; 30:7;31:24). The split between capital costs and operating costs for EPA requirements is about 80–20; that is, the operating cost of an environmental system runs about 20 percent of the initial capital cost on an annual basis. This ratio varies among industries and according to the degree of environmental pollution abatement expected from the capital projects. For the steel industry, for example, it averages about 15 to 20 percent with a range of 7 to 46 percent (32:6;33:120;34:149;35:7).

The outlook for future EPA-related costs is not so clear as it is for OSHA-related costs for two reasons: **First,** environmental laws and regulations that significantly affect American industry are still being added. The impact of the Resources Conservation and Recovery Act (RCRA), for example, is just now being felt as a cost to industry. The **second** reason for the clouded future is related to the strength of the current economic recovery. As excess and dormant capacity is brought back on line, environmental capital and operating cost will rise considerably. The rule of thumb is that the first 80 percent of industrial plant capacity will

experience average retrofit costs. But getting the last 20 percent of idle capacity back on line will escalate environmental costs on a logarithmic growth basis (5:65).

In sum, OSHA and EPA cost American industry about 1 to 2 percent of capital expenditures, with another increment of operating cost represented as being about 2 to 4 percent of capital costs. Costs to major defense contractors are considerably lower than the average, because these firms generally are clean operations, and have been in the forefront of meeting OSHA and EPA requirements. Supporting subcontractors and suppliers, however, probably experience costs greater than average. Taken together, costs to the defense industry probably mirror costs experienced by American industry as a whole.

3

OSHA- and EPA-Related Costs

OSHA–RELATED COSTS

SINCE 1970 OSHA-RELATED COSTS have demonstrated a distinct pattern. This pattern was associated with the start-up and maturing of OSHA and related laws and standards. When OSHA initially was chartered, Government, industry, unions, workers, and the general public all had expectations of what OSHA would accomplish and how quickly it would start functioning. OSHA was expected to come out running, and everyone grew impatient as OSHA deliberated on setting standards. OSHA felt pressured to speed up the standard-setting process, so it turned to voluntary industry associations (ANSI, NFPA, and others) as well as to existing Federal Safety Standards as sources of ready-made standards. Consequently, in 1971 OSHA took the Federal Safety Standards and the bulk of the voluntary standards and reissued them as mandatory OSHA standards. This action was done without adequate review, and it gave OSHA a poor reputation that took years to overcome.

The American National Standards Institute (ANSI) had been issuing voluntary health-and-safety guidelines with other associations since 1918. More than 12,000 standards had been issued, most of which had been well accepted, especially electrical and fire codes. Some standards had little value; but because they were voluntary they caused little difficulty for industry. That situation changed when OSHA declared them mandatory. OSHA now required split toilet seats, specified the hanging height of fire extinguishers, and even dictated the temperature of restroom hand driers. Other standards were downright confusing, such as "piping located inside or outside buildings may be placed above or below ground" (36:9).

Such ridiculous standards caught the attention of the media and overshadowed hundreds of beneficial standards, such as machine guarding, deadman switches, and standardized hazard-warning signs and labels. The result was a negative attitude toward OSHA that was hard to reverse. That negative attitude still is echoed in statements to the effect that OSHA is ineffective, antibusiness, and financially burdensome to industry (37:2).

Just as OSHA was ill prepared at the outset to issue carefully thought out standards, OSHA inspectors also were starting at ground zero. OSHA had to recruit and then train inspectors, because the pool of experienced safety specialists and industrial hygienists was inadequate to staff the inspection function. Consequently, the neophyte OSHA inspectors wrote up violations of standards that they easily could recognize and that were not scientifically disputed. Plant-inspection writeups were full of such violations as two-prong versus three-prong electrical plugs and ungrounded wall sockets. Ventilation-system deficiencies and heat-stress problems, however, almost never were mentioned, even though they existed. OSHA inspectors initially were unsophisticated and wrote up the obvious and the mundane. With time, however, OSHA inspectors, hence OSHA inspections, matured and gained technical competence and respect.

Managers of industrial firms and their health-and-safety staffs also were new at the OSHA game. The corporate staff could get copies of the *Federal Register* and try to determine the essence of standards published in that document. The result too often was confusion, followed by resignation to whatever the OSHA inspector wrote. Firms that did have experienced health-and-safety staffs and did make an effort to catalog hazards and estimate corrective costs faced another dilemma. Should they correct those hazards ranked highest in terms of death, disability, and lost-time injuries? Or should they correct such OSHA-recognized hazards as the two-prong plug? Priorities often were reset from solving real problems to solving compliance problems. One aerospace firm determined that the cost of OSHA compliance would be $3.5 million, but only $0.4 million for correcting real hazards (10:53). Nevertheless, before OSHA existed neither of the two sums would have been funded.

As OSHA matured, programs, standards, and inspections were significantly improved and gained industry acceptance. OSHA has deleted many of the ridiculous standards and has converted others from specification standards to performance standards (for example, from specifying the type and thickness of wood in a ladder rung to specifying only its strength). This retrenchment was not easy; for example, unions viewed any rescission of standards as a retreat to the unsafe working conditions that existed before OSHA (38). Even changes in color and size of warning signs drew protests from safety-sign manufacturers and paint companies that had made capital investments based on the original standard.

With time, industry accepted OSHA standards, and costs associated with them. Existing plants and equipment were retrofitted where possible and where economical to meet OSHA standards. These standards were incorporated into new plant and equipment throughout American industry. In some cases, the forced change was even cost effective. The vinyl-chloride standard, for example, forced the chemical industry to protect its employees from exposure to raw materials used in vinyl-chloride production. Product-input leaks were detected and corrected, and systems were redesigned. The amount of product constituents and the products thus saved paid for the OSHA-mandated changes (10:540).

Costs to retrofit plant and equipment initially were easy to recognize and quantify. Later, as OSHA standards were incorporated into changes dictated by technical or manufacturing requirements, cost identification became difficult. When new plants were built, OSHA standards became part and parcel of commonly accepted design standards. Equipment for new plants was ordered from firms that had long ago incorporated OSHA standards into their products. Purchase of equipment that does not incorporate OSHA into its design is not possible today. This factor puts US production machinery mothballed under the Defense Production Act in the classification of antiques. Thus, costs and benefits of OSHA are not obvious today as far as accounting trails are concerned.

OSHA also irreversibly affected the worker. Emphasis on preventive medicine through worker education raised the health-

and-safety consciousness of employees, changed perceptions of prior work practices, and raised levels of worker expectations. Good health-and-safety practices, protective equipment, and a demand for safe products on the job and at home have become accepted ways of life in industry. Hard hats, safety shoes and glasses, and ear protectors not only have gained acceptance by workers but also have become status symbols of the American workers. From the employee's point of view, there is no turning back.

Therefore, studies of OSHA costs understandably are few, often are inaccurate and unreliable, fail to report total cost and incremental costs, and incorporate a whole host of modifying factors and assumptions in the study design and results. A few high-quality studies, including the Arthur Anderson study done for the Business Roundtable, deal with incremental costs. They indicate that the bulk of OSHA costs would have been borne by industry as accepted practice in today's environment even if OSHA had not mandated them. Industry is finding that its response to OSHA standards is, on the average, cost effective over the long run. Interviews with well-informed DOD officials, defense contractors, and industrial association representatives corroborate this finding and agree with studies reporting similar findings. OSHA has worked through its birth pains and has come of age; today, OSHA is an integral part of doing business.

As OSHA matured, several of its standards were challenged in court. The Supreme Court threw out the benzene standard, because OSHA failed to show that the benefits of a stricter benzene standard (a lower allowable concentration of benzene in the workplace) were greater than the costs required to meet that standard (39:68). At first review, the courts seemed to demand a benefit-cost ratio equal to or greater than 1.0. This appearance was not the case, however, as the court later upheld a similar challenge to the cotton-dust standard, even though a thorough benefit-cost ratio analysis failed to exceed unity. The Supreme Court recognized the difficulty of placing a value on human life on the benefit side of the ledger. Thus, the legal system has upheld the OSHA philosophy.

Discussions with industry representatives and defense contractors indicate that OSHA has become a cooperative partner

with industry, rather than an adversary, as was the case in the 1970s (appendix B). Some people attribute this phenomenon to the current Republican Administration; others see the change as simply the maturing of OSHA. Most people, however, see the new phase as a combination of the two influences. As such, they foresee increased promulgation of standards by OSHA in the future, but on a strong scientific and economic foundation.

EPA–RELATED COSTS

HISTORICALLY, EPA REGULATIONS HAVE BEEN AIMED at industries whose processes have the potential for major environmental damage. These industries usually are basic industries, where a great deal of product is contained in air, water, and solid waste leaving the facilities. The iron-and-steel industry, for example, without controls would emit a considerable volume of iron oxide into the air. Iron-and-steel wastewater streams contain considerable amounts of iron and other heavy metals, and high volumes of acid waste. This situation also is true of industries involving chemical, nonferrous metals, electroplating, agricultural products, and mining.

Defense industry, however, uses products from basic industries in finished form, and its activity consists largely of assembly and fabrication. Defense industry, by and large, is clean and has minimal potential for major environmental damage. Consequently, the EPA has had a minimal cost impact on defense industry. By and large, capital costs mandated by the EPA have been met, and most retrofit of existing facilities has been completed. Pollution-control expenditures, expressed as a percentage of capital planned for 1981–83, average 6.3 percent for all manufacturing, with a range of 0.6 to 19.6 percent within manufacturing. For the aerospace industry, it is 0.6 percent; 1.8 percent for autos, trucks, and parts; and 2.1 percent for machinery (22:10). This low ratio for these three defense-related cate-

gories reflects the fact that clean-air-and-water requirements were met before and during the early EPA years. This factor indicates that defense industry is stable and has not experienced major expansion requiring massive environmental control expenditures.

EPA regulations, unlike those of OSHA, are targeted against industrial processes that have major environmental impacts; these processes usually are located in areas where the environment has been most seriously damaged or where environmental degradation has not yet occurred and is prohibited. For example, heavy metals in wastewater effluent are a major EPA concern, as are total hydrocarbon emissions in the atmosphere. Plating operations, sand blasting, paint stripping, and corrosion control are a few of the processes that generate wastes containing heavy metals. Removal of heavy metal is expensive and would represent a significant level of capital and operating costs. To the extent that a major defense contractor performs these processes in-house, these treatment costs parallel the generating processes. Hydrocarbon emission into the atmosphere is a major air pollution concern. Hydrocarbons react with ozone in the presence of ultraviolet radiation to form photochemical oxidants responsible for smog. Consequently, control of hydrocarbon emissions could represent a considerable capital investment. Hydrocarbons are generated by industrial operations such as painting, solvent cleaning, or degreasing. Again, to the extent that these operations are done in-house, abatement costs will be required.

Geographical location plays an important role in determining environmental costs. Most corporations elect to use municipal wastewater treatment facilities, because this system is economical. Usually, pretreatment of industrial wastes is required to protect the municipal treatment plant (usually a biological process) from toxic effects of the wastes. The degree of pretreatment required is geographically related. If a defense plant is located adjacent to a waterway designated as an important fishery, treatment standards required of the municipal treatment plant—as well as pretreatment requirement for the firm's industrial wastes—will be stringent. Conversely, if receiving water standards are low, costs will be relatively low.

The size of a municipal waste-treatment facility also influences industry costs. Industry pretreatment costs usually are inversely proportional to the size of the community. If a firm's wastewater volume is low, compared with that of the community in which it is located, pretreatment costs will be low, because the dilution factor affords protection from toxic upset. Consequently, pretreatment costs per gallon of industrial waste would be lower for McDonnell-Douglas Corporation in St. Louis than for Fairchild Industries in Germantown, MD.

Unlike OSHA regulations, which are independent of the concentration of industry in an area, EPA regulations are modified to the extent that industry—hence industrial pollution—is concentrated in an area. Consequently, as more industry is attracted to an already industrialized area, environmental standards are tightened for all inhabitants. The impact of this situation is to raise the unit environmental costs when production is significantly increased. This impact especially is true for air-pollution standards.

Geographic location plays a major role in determining air-pollution-control costs, but in a unique way. If a firm is located in an area experiencing significant air pollution, standards will have been imposed at considerable costs. In the event a firm wants to locate in a basin, or expand existing operations there, the incremental cost of doing so will be very high—perhaps prohibitive. Because no additional air pollution would be permitted, firms are inhibited from locating or expanding in the area unless they find some way to offset that expected increment of pollution by lowering pollution levels from existing plants there (40:67). For example, a firm desiring to add a paint-spray operation to its plant could purchase and close (or modify) dry cleaning stores to offset the expected hydrocarbon pollution from the painting, since dry cleaners also emit hydrocarbons.

As was the case for OSHA standards, most EPA-related retrofit requirements have been met by industry. Some plants within certain industries chose not to retrofit older production facilities and either have built new plants, or have accepted reduced capacity. Opponents of environmental regulation will argue that the incremental cost of EPA forced the closing of factories and plants in communities that depended heavily on their

existence. Little evidence supports this claim, although this view often is flaunted in trade journals and by some industrial associations. An extremely high cost estimate for environmental retrofit usually indicates a plant that is not productive and cost effective, when measured against most commonly accepted economic standards used by that industry. In other words, inability to meet environmental standards often indicates an inability to meet productivity and profitability standards as well. Plant closures generally are caused by failure to meet economic standards, not environmental standards, although the reasons may be publicly stated otherwise. In fact, some authorities contend that the decision to close a plant and build a new facility to meet environmental standards often has resulted in a net gain in productivity and profitability (4:24).

A negative fact is that regardless of the cause some plants were shut down and not replaced, especially foundries. This fact is especially true in today's period of excess industrial capacity. In the event of surge or industrial mobilization, industrial capacity represented by closed plants will not be available. Waiver of environmental regulation during industrial mobilization would be moot, because waivers could not bring back a foundry, for example, that had been closed and torn down. To the extent of reduced industrial capacity, EPA regulations may have had at least a modest impact on future costs of weapon-system acquisition during surge or industrial mobilization.

4

Department of Defense Position

THE DEPARTMENT OF DEFENSE (DOD), more than any other government agency, is affected by EPA and OSHA regulations. This effect occurs either directly in DOD-operated facilities, such as naval shipyards, or in facilities of private corporations doing business with DOD. The interest of DOD and national security can be served if the extent of these impacts can be ascertained during both the normal peacetime atmosphere and a time of national emergency, when industry must surge for increased production or be mobilized to support the increased readiness of the armed forces. Knowing the dollar costs of meeting these regulations is important for supporting budget inputs and developing tradeoffs; these tradeoffs determine whether certain facilities and processes can be operated in an efficient and cost-effective manner. Potentially more important is the need to identify factors that would delay the delivery of equipment, facilities, or services; action then may be taken to ensure that such deliveries will support current and future surge mobilization needs.

Initially, in the early 1970s, EPA and OSHA "came on strong" with regulations that covered everything from toilet seats to nuclear radiation, and affected nearly every industry in the country. The regulations, if enforced to the letter of the law, either could force some industries to close because they could not meet the requirements, or could increase the cost of doing business to an unacceptable level.

By Executive direction, Government agencies were, and still are, required to comply with EPA and OSHA regulations. Also, DOD policy was, and still is, that DOD activities—and contractors working under DOD contracts—will comply with EPA and OSHA regulations (41). Subsequent resistance by contractors and DOD activities required to comply with regulations caused the DOD to work with EPA and OSHA to refine and clarify what requirements industry could be expected to satisfy and still provide satisfactory environmental, health, and safety protection. Impact on industry, cost effectiveness of regulations, and the history of the industry in meeting environmental, health, and safety

standards now are considered when preparing, issuing, and enforcing regulatory requirements

By Government and industry working together, compliance with these regulations has resulted in safer working conditions, and much of the industry has become more efficient and productive. Industry claims that 85 to 90 percent of OSHA's safety regulations would be met without OSHA (appendixes B, C and D). Industry recognizes the lower expense of meeting environmental, health, and safety requirements, than enduring lawsuits, injunctions, high insurance rates, and lost time by skilled and highly productive workers because of accident or sickness.

During a period of surge production or industrial mobilization, environmental protection and the safety and health of the workforce would remain a priority national objective. Increased production could involve the surge of a single industry to support a specific material need of the United States or an ally, or the mobilization of all industry to support a global conflict. In either case, capacity and capability of industry must be available to support the effort.

At the present time, capability and capacity generally are available for surge production. Because of lead times for hi-tech components or complex weapon systems, however, 18 months may be required before significant, sustained, and increased production could be achieved. Less time would be required for simpler material or equipment, such as ammunition.

Increased production can be achieved in one or more of the following ways

1. Increase production in existing facilities through the use of overtime, additional workers, or additional shifts.

2. Open facilities that had been shut down for various reasons, including inability to meet environmental, health, and safety regulations.

3. Modify operating or closed facilities to produce new or different product lines.

4. Build new facilities.

For any method to increase production, an assessment must be made of the impact of environmental, health, and safety regulations. Consideration must be given to the following factors:

1. Increased production in existing facilities will result in increased air-and-water pollution, necessitating an evaluation of whether clean-air-and-water standards will be met. OSHA health-and-safety requirements must be evaluated as more people and pollutants enter the workplace because of increased production. Old equipment pressed into service will be required to meet current safety standards.

2. Reopening old facilities will require a complete review for compliance with environmental, health, and safety requirements. The extent of this review will depend on how long the facility had been shut down and its degree of compliance before shutdown. Some Government ammunition plants have been shut down more than 25 years (42). As a result, no pollution abatement equipment has been installed, and the mothballed production equipment has not been OSHA updated.

3. Modifying a facility to produce a different product than that for which it originally was designed will require a review of environmental and health facilities. This review will determine whether these facilities are satisfactory or must be upgraded or modified to handle new processes and materials.

4. New facilities should be built with the latest pollution-control and safety equipment installed. Purchase of equipment without safety features installed is difficult, as manufacturers are concerned with lawsuits for selling unsafe equipment. Obtaining environmental impact statements and eventual approval generally consumes considerable time and effort for most new facilities.

During mobilization, a large demand for pollution abatement equipment, health-and-safety equipment, and modification kits to upgrade the safety of existing equipment could be experienced. Whether production of this equipment could surge to be delivered in sufficient time to support the mobilization schedules of the facilities is not certain.

During a production surge or industrial mobilization effort, instances will arise where industry cannot meet environmental,

health, and safety requirements. This event could happen for a number of reasons, such as the unavailability of pollution-control equipment, lack of technology, insufficient time to install equipment, and lack of equipment with safety features incorporated. Since the paramount reason for a production surge or mobilization is the production of more material in the shortest possible time, considerable controversy will arise if any delays are attributed to EPA and OSHA regulations.

Recently, results of the past lack of environmental, health, and safety safeguards have been seen. The Times Beach and Love Canal contamination, black lung in coal miners, brown lung in textile workers, silicosis in foundry workers, asbestosis in shipyard laggers, and hearing loss throughout industry have resulted in high costs to industry and government. Many lawsuit settlements today are from exposures dating back to World War II, and such claims can be expected to increase in the future. Recent court decisions are placing the burden of proof on industry to prove that it is innocent, rather than on the worker to prove that industry caused the problem and that he was not a substantial contributor. Most of these problems would have been prevented if current requirements and procedures had been available and utilized.

At present, technology is developing many new substances about which little is known, including long-term exposure risk. The use of these substances without adequate research into environmental protection and worker-health protection could result in serious future problems. In the event of a production surge or full-scale mobilization, many production facilities would have no responsible means of complying with environmental health-and-safety regulations without delaying surge production. The production facilities that could not have the necessary features installed to meet environmental, health, and safety regulations would become candidates for waiver of these regulations. Waiver is used in the context of either eliminating or relaxing the requirement, recognizing that some control or limits are better than none.

Waiver of EPA and OSHA regulations might seem at first like a simple solution; however, in view of past experiences those in authority will be reluctant to waive any requirements,

particularly where they involve health and safety. Workers and unions who have been accustomed to safe and healthy working conditions also will be reluctant to regress and accept any reduction in health and safety features in the workplace. Past indiscretions concerning the environment will cause environmentalists to be alert to and probably resist any new facilities that will adversely affect the environment. Industry itself may be reluctant to accept or implement some waivers—particularly those that have the potential for long-term exposure to hazardous substances or environmental damage—unless Government were to grant immunity from future lawsuits or assume responsibility for damage. This condition would not occur in Government facilities, since the Government is its own insurer.

Existing Federal laws make a number of provisions for waiving environmental regulations (table 4-1). The Presi-

Table 4–1
Waivers from environmental regulations

Law	President May Authorize* Waiver from Regulations	
	Federal Agencies	Private Contractors
Clean Air	yes	yes
Water Pollution Control	yes	no
Solid Waste Disposal	yes	no
Toxic Substances	yes	yes
Noise Control	yes	no
Public Health/Safe Drinking Water	yes	no
Environmental Impact	yes	n.a.*

Source: Draft Study Report "Industrial Base Actions in a Period of Rising Tension." June 82 (43:13).
*Applies only to Federal actions.

dent may invoke these provisions if he makes the findings required by the various laws. DOD can waive all OSHA regulations, but not all EPA regulations, in the event of an "official" national emergency. DOD feels that OSHA waivers, if any, can be worked out between the DOD and the Department of Labor. Each facility will be reviewed on a case-by-case basis by qualified military industrial hygiene or safety officers who will be recalled to active duty during mobilization specifically for this purpose.

While existing laws make some provision for waivers, authorities provided would be inadequate in a number of respects as follows:

- Several important environmental laws make no provision to exempt privately-owned facilities.

- No authority exists to waive regulations controlling the discharge of hazardous materials or toxic substances into the land, air, or water.

- No statutory provision exists to waive the preparation of environmental impact statements for major Federal actions, as required by the National Environmental Policy Act (NEPA). However, DOD feels that special arrangements with the chief of engineers could be utilized in the event of a national emergency.

In the event of a national emergency, changes to the law to issue waivers would be expected; where current authority is lacking, this authority would be relatively easy to obtain. This premise is particularly true if the emergency is for a popular cause, with the consensus of the public. The Congress is not being asked to amend the acts specifically at this time—to include waiver provisions in advance of any emergency—because to do so might result in unwanted changes of the acts. As existing legislation comes up for congressional renewal, the laws should be amended to strengthen waiver authorities. These provisions would allow the President to waive the regulations in the event of a national emergency.

Also needed is an identification of what waivers would be required for varying degrees of mobilization. Each situation must be evaluated, to determine whether a waiver would result in a

hazardous situation, and the impact on national defense if the waiver were not issued. Where hazardous conditions could result, contingency plans should be made to reduce the lead time to bring the facility into compliance.

Individual States and local governments have become increasingly concerned with environmental, health, and safety issues in industries within their jurisdictions. As a result, State and local governments have enacted laws to protect their specific needs. These laws may be more stringent than Federal regulations, or may include areas not covered by Federal regulations. If Federal regulations were waived in the event of a national emergency, would State and local governments also waive their laws? Hope says that they would, but nothing guarantees that they would. Federal law does not replace State and local government laws in this respect, and State and local government laws do not necessarily yield to Federal Government determinations. This dichotomy might be resolved with a Federal law that makes Federal regulations the only legal requirements in cases where a waiver has been issued by the President. Action of this type probably would be viewed as an infringement on state's rights and almost surely would involve a challenge in the courts on constitutional grounds. It also would be challenged as an unconstitutional delegation of legislative power by the Congress to the President.

Many problems with State and local governments would be resolved if the Federal government worked more effectively with these governments to develop mobilization planning. State and local officials complain that little is done to inform them or work with them in these matters.

5

Impact of OSHA and EPA on Industrial Mobilization

THE IMPACT OF OSHA AND EPA on industrial mobilization will depend largely on three factors. The first factor is the speed at which defense contractors, their suppliers and subcontractors, and, in turn, *their* suppliers and subcontractors can have their OSHA-EPA problems identified and placed under the Defense Production Act. The Defense Production Act allocates resources to defense contractors in the event of mobilization. Allocation of health-and-safety-control and pollution-abatement funds, equipment, or waivers should be a part of the allocation mechanism of the Defense Production Act.

The second factor deals with the way the Government approaches waivers to environmental, health, and safety requirements. To waive a requirement is one thing, but to waive liability long after mobilization ceases is entirely another matter. Mobilization in World War II ensured success; but liability for asbestosis in shipyard laggers, for example, was not foreseen or waived, and came back to haunt industry even to this day. Today, OSHA is only a part of the larger web of legal constraints that has been woven throughout American industry. OSHA rules and regulations can be waived, but liability waiver does not follow. Industry will be reluctant to accept a waiver of OSHA requirements because of the issue of liability. Industry also will look at OSHA waivers negatively, because skilled employees are valued and often irreplacable production assets. To a lesser degree, EPA waivers also may be unacceptable to industry because of the future liability question. In many instances, actions thought correct at the time later were ruled inadequate, and industrial firms were held liable for environmental damage. The Love Canal issue and the recent Times Beach dioxin problem are two examples. Because the wavier of environmental requirements cannot guarantee the waiver of future liability, industry would be reluctant to seek EPA waivers.

The third factor affecting the impact of OSHA and EPA on industrial mobilization is the degree to which subcontractors, suppliers, and small jobbers are still in business. How deep is

defense-production capability? If it is no deeper than the current defense-contracting base plus, say, about 20 percent, waivers of OSHA and EPA requirements are of academic interest only. Today's defense industry is in compliance with OSHA and EPA and easily could stay in compliance even with a three-shift per day, seven-day a week production schedule. Many informed people, such as Dr. Murray Weidenbaum, former chairman of the Council of Economic Advisors, believe that the defense-industry base has shrunk considerably, and that standby or mothballed capacity does not exist (44:61). If this premise is true, waivers of air-quality standards for a foundry that no longer exists is indeed a moot point. However, the degree to which idle or standby industrial capacity exists is beyond the scope of this study. If it does not exist, OSHA and EPA waiver mechanisms are meaningless. If the base does exist, wavier mechanisms still may not be useful, because of industry's concern for future liability, worker expectations, the need to protect labor assets, and the inability to return to pre-OSHA-EPA equipment and industrial processes.

Taken together, these three factors indicate that the impact of OSHA and EPA on industrial mobilization will represent a modest 1 to 2 percent of capital costs, and, based on current experiences, a smaller percentage of that for operating costs. OSHA and EPA requirements should be able to be incorporated into plans for surged production at existing facilities and into newly constructed or modified facilities. Meeting OSHA and EPA requirements should not delay production schedules. The one "fly in the ointment" is stockpiled production facilities and equipment. These facilities probably can be brought rapidly up to standards, but the equipment may present a problem. Industry's experience (appendix C and D) with getting this old equipment up to OSHA standards paints a dark picture for mobilization. Perhaps an overriding consideration for the use of this mothballed equipment is not whether it can be upgraded to meet OSHA standards, but whether it can be used at all to meet today's exacting manufacturing tolerances for defense products.

Even though the impact of OSHA and EPA or industrial mobilization seems moderate, acceptable, and perhaps even cost effective over the long haul, this view is not to say that problems will not exist. The mechanism for production-resource allocation is contained in the Defense Production Act and in the DOD and

Federal Emergency Management Agency (FEMA) organizations established to implement that act. OSHA- and EPA-related resource allocations need to be established and properly administered within the larger context of mobilization. The question of postmobilization liability also must be addressed realistically. To date, this inequity has not been addressed at all by industry, EPA, OSHA, or FEMA, and only minimally by DOD.

Conclusions and Recommendations

CONCLUSIONS

THE CONCLUSIONS LISTED HERE have been drawn from this study by the authors.

1. The true current cost impact of OSHA and EPA is not well defined, and costs often are not separable from other business costs.

2. Initial cost of OSHA and EPA to industry was significant, but current OSHA-EPA costs are declining to below the 1 to 2 percent level.

3. OSHA is only a part of the safety-and-health aspect in American industry. State programs—such as workmen's compensation, the insurance industry structure, labor contracts, product-liability requirements, and civil liability issues—play an equal role with OSHA in safety-and-health costs.

4. Environmental protection does not have as large a constituency as does safety and health (for example, environmentalists versus employees); but it is firmly entrenched in Federal, State, and local laws, regulations, procedures, and expectations.

5. The Reagan Administration is business oriented, and this attitude has influenced how OSHA and EPA deal with industry.

6. OSHA and EPA are now cooperating with industry in a joint effort to fulfill environmental and health objectives.

7. Organized labor strongly supports OSHA.

8. The public supports OSHA and EPA requirements, and industry supports the bulk of these requirements.

9. Recent lessons from past mistakes have underscored the importance of long-term liability concerns for environmental damage and for health-and-safety claims. Government and industry are paying for past indiscretions. As a consequence, liability is a major issue today and will continue so in the future.

10. Mothballed defense plants do not meet EPA requirements, and much of the mothballed defense-production machinery does not meet OSHA requirements.

11. The Occupational Safety and Health Act contains waiver provisions for Federal activities and private contractors in the event of a national emergency. Four of six environmental protection laws applicable to private contractors, however, contain no waiver provisions for national emergency operations.

12. Industry plans on meeting OSHA and EPA requirements as an integral part of surge or mobilization efforts.

13. Industry is unaware of possible waiver approaches for OSHA and EPA requirements in the event of a national emergency.

14. The Reagan administration is reluctant in advance of industrial mobilization to attempt to insert waiver provisions in environmental laws where they are lacking, because the Administration may not be able to control congressional action in reviewing the legislation. The current Administration-Congress standoff—with resulting continuing resolutions each year—is preferred by both sides.

15. EPA, OSHA, and FEMA have not looked at any aspect of OSHA or EPA concerns during surge or industrial mobilization.

16. DOD has looked at OSHA and EPA concerns during surge or industrial mobilization and does not consider that any action is required now. Current informal plans are to examine issues and waiver requirements, if any, as they occur during industrial mobilization.

17. The severity and degree of public concern over any national emergency will determine whether and to what extent environmental, safety, and health waivers will be granted.

RECOMMENDATIONS

THE AUTHORS OF THIS STUDY make the following recommendations:

1. Evaluate and prepare studies addressing the question of liability for health or environmental damage caused by mobilization-induced waivers, but which appears only after mobilization has ended.

2. Evaluate requirements for, and approaches to, bringing stockpiled defense-production machinery up to OSHA and EPA standards, if it still meets production specifications.

3. Define specifics of the standby or mothballed defense-industry base that could be available for surge or mobilization as these specifics relate to OSHA and EPA requirements. Keep these specifics updated.

4. Establish plans to obtain and implement waiver mechanisms incorporating Federal, State, and local jurisdictional concerns.

5. Evaluate and rank priorities for the allocation of funds, existing equipment, and waiver requirements for Federal and private production facilities and supporting subcontractors required for production surge or mobilization.

6. Establish mechanisms to incorporate environmental and health-resource requirements into Defense Production Act procedures.

Appendixes

A.
Research Project Note-Taking Guide

B.
Views of Industrial Trade Associations

C.
General Dynamics-A Corporate View

D.
McDonnell-Douglas Corporation

E.
General Dynamics, Electric Boat Division,
Groton, CT

F.
Supervisor of Shipbuilding, Groton, CT

G.
Norfolk Naval Shipyard, Portsmouth, VA

A

Research Project Note-Taking Guide

Name:

1. What is the function or mission of your office?
2. What office in your organization is responsible for health and safety?

   For environmental affairs?

   How big is the operation, and to whom do the directors report?

   Has this group increased, decreased, or stayed the same since 1975? Why?
3. How does your firm learn about new or proposed legislation that might affect your operations?

   How do you interact with other agencies?

   Do you affect legislation, lobby, have letter campaigns, have Political Action Committee membership?
4. Historically, what has been the impact of EPA or OSHA on your organization?

5. Aside from cost, how do EPA or OSHA regulations affect your firm? Has your firm had any litigation with OSHA or EPA?

   Do State or local government roles in the environment-and-health area affect your firm? If yes, how?

6. To what extent has EPA or OSHA been responsible for lost or restricted capacity?

7. Have the costs (dollars or time) of EPA or OSHA been identified by either your firm or your industrial associations? If so, what are these costs, or what is your best estimate? Annual, one time, or recurring? Expressed as percentage of final product costs?

8. How do you cost out these expenses? Overhead?

9. How much of these costs are capital costs (such as treatment facility or scrubbers), and how much are maintenance or operating costs?

10. How are your suppliers and subcontractors affected by EPA or OSHA?

11. If your firm is a Government-owned-contractor-operated (GOCO) operation, what EPA or OSHA costs are your responsibility, and what are the Government's responsibility?

12. Do you anticipate further OSHA or EPA regulations to affect you? Explain.

13. If you were asked to surge your production under *peacetime* conditions (double it), could you do it? What could you do? What would be the constraints or bottlenecks? How long would it take? How would EPA or OSHA affect this?

14. Same as above except for industrial *mobilization*. Need any waivers of EPA or OSHA rules?

15. Are you aware of any DOD plans to implement an EPA or OSHA waiver system in the event of industrial mobilization?

B

VIEWS OF INDUSTRIAL TRADE ASSOCIATIONS

THE FOLLOWING ASSOCIATIONS were visited: Aerospace Industries Association; American Iron and Steel Institute; National Association of Manufacturers; Shipbuilders Council of America; and the US Chamber of Commerce. Interviews with representatives of these associations revealed commonality in several areas.

1. Data relative to the cost of OSHA or EPA regulations on industry (in time and money) were neither identifiable nor maintained.

2. Initial cost for compliance with EPA standards was high, but modern machinery and equipment that have evolved from these requirements are not only cleaner but also more cost effective. This phenomenon is especially true for the steel industry.

3. In the event of mobilization, industry would seek relief from EPA requirements before it would seek relief from OSHA regulations. This priority is true because of the ingrained nature of OSHA regulations in the labor force and general acceptance of these standards by society.

4. EPA regulations do not enjoy the same degree of support by labor and the general public as do those of OSHA.

5. Industry is of the opinion that many OSHA regulations are questionable, and that labor abuses these and other regulations. Labor, however, is very supportive of OSHA.

6. Some people believe that the cost to industry of compliance with OSHA regulations exceeds the benefits gained, although they could not quantify this belief.

C

GENERAL DYNAMICS— A CORPORATE VIEW

GENERAL DYNAMICS CORPORATION is one of the largest defense contractors; it manufactures a variety of defense products, including the F-16 fighter, the M-1 tank, and nuclear submarines. All aspects of environmental protection and occupational health come under the corporate Manager for Safety and Industrial Health. At the plant level, occupational safety and health comes under Industrial Relations; environmental protection is the responsibility of plant management. Each plant has 10 to 15 people dealing with health and environmental issues.

General Dynamics, as many aerospace industry firms, has a long history of compliance with Federal, State, local, and corporate health, safety, and environmental standards. Most of the major expenditures for OSHA and EPA have been made in prior years. General Dynamics believes that about 75 percent of OSHA and EPA requirements would have been met even if they had not been mandated, because compliance was good business and was economically cost effective. The value of the other 25 percent is questionable. About 20 to 25 percent of OSHA or EPA cost is capital cost, and the rest is operating cost. Capital costs were much higher in the early 1970s. Total costs are expected to remain steady or to decline in future years. However, the impact of the Resources Conservation and Recovery Act

(RCRA) remains to be seen. Corporate policy is to accept OSHA and EPA costs.

General Dynamics has noted a marked improvement in its relationship with OSHA and EPA; this improvement primarily is due to the current Administration's attempt to take a reasonable and cooperative approach toward industry. Relationships are now cooperative and not antagonistic, as they sometimes had been in the past. Both Agencies have shown a willingness to work with General Dymanics and to solve problems on the spot as they occur without resorting to formal writeups.

Areas of sincere disagreement, however, do crop up. One of these disagreements concerns OSHA's approach to the lead standard at the Electric Boat Division. OSHA has required expensive engineering controls to prohibit lead exposures; the Agency has not allowed substitution of a less expensive program using personnel protective equipment and biological monitoring. This concern carries over into the proposed nickel and chromium standards now under review and comment. An engineering-control approach to these two proposed standards could prove extremely expensive and bothersome. General Dynamics pointed out that the firm is following International Nickel Company's (INCO) effort to gather epidemiological data on their workers exposed to nickel over the years, as a defense against a nickel standard requiring the engineering-control approach.

The Product Liability Act is causing General Dynamics and other aerospace firms some unforeseen problems. OSHA cited General Dynamics' Fort Worth plant for an unsafe press brake, despite attempts to get it into compliance. The Company then went back to the manufacturer for additional parts, but the manufacturer refused to supply the needed parts unless General Dynamics bought a complete OSHA modification kit and held the firm harmless. The end result was a cost of $400,000 to obtain a new press brake. An attempt was made to obtain a replacement machine from the DOD industrial machinery stockpile. But those press brakes, as much of the stockpiled machinery, also were in violation of OSHA standards. The fact that DOD-stockpiled machinery is pre-OSHA does not bode well for mobilization.

General Dynamics sees RCRA requirements as looming large on the horizon and not amenable to the administration's

relaxed attitude. Costs of disposing of current wastes are high and are expected to climb, as more stringent requirements are laid on waste generators, waste haulers, and disposal contractors. Costs for waste-disposal mistakes in the 1940s, 1950s, and 1960s also are increasing. The General Dynamics Fort Worth plant, for example, currently is paying $10,000 per week to pump out ground water and treat it to remove a solvent that leaked into the ground water table more than 20 years ago. The State EPA had mandated this remedy, and no end is in sight.

General Dynamics was asked about OSHA and EPA impact on its surge or mobilization capability. The firm indicated that it would meet any and all OSHA and EPA requirements required for expanded production. The firm believes that increased production would place the skilled worker—and even the semiskilled but trainable worker—at a premium. General Dynamics' recent experience with surge at its Electric Boat Division (appendix E) reinforced experiences dating back to World War II; these experiences indicate that lost-time illnesses and injuries can be expected to increase significantly with increased production. Anything that can be done, therefore, to reduce these expected losses should be undertaken aggressively. General Dynamics believes that incorporating OSHA requirements into surge or mobilization efforts will be cost effective. Incorporating EPA requirements also should be cost effective but in the long run, rather than immediately. The current Fort Worth ground-water-contamination problem serves as an expensive example that should be avoided in the future. The question of future liability after surge or mobilization (such as asbestosis in World War II shipyard workers) also would drive General Dynamics to accept OSHA and EPA requirements during periods of increased production.

D

McDONNELL–DOUGLAS CORPORATION

AT McDONNELL-DOUGLAS, occupational health and safety come under the Personnel Department, and environmental protection is the responsibility of Plant Engineering. Most contact on health and safety issues is with OSHA, although the State of Missouri gets involved through its Workmen's Compensation Administration and the Industrial Commission of Missouri (investigative arm of the Workmen's Compensation Administration). These two State agencies interface with EPA on environmental issues, and with State and local agencies on wastewater matters. Relationships with OSHA and EPA have improved markedly since the advent of the Reagan Administration. McDonnell-Douglas believes that both OSHA and EPA are now playing fair and being cooperative. The Federal agencies also have reduced the frequency of inspections and inquiries. Since OSHA came into being, McDonnell–Douglas corporation has had only $1,200 in fines and 30 citations. The firm feels this record is outstanding.

McDonnell–Douglas Corporation, along with many aerospace firms, has had a history of compliance with health-and-safety standards. This record is due to the influence of the firm's California-based operations. California had stringent health-and-safety standards years before the Occupational Safety and Health Act was enacted. In addition, the aerospace industry is a

clean industry and has not been particularly troubled with health-and-safety issues and environmental problems.

As at General Dynamics, the Product Liability Law has created problems for McDonnell–Douglas. An original equipment manufacturer was reluctant to sell parts for a drop hammer unless the corporation purchased an OSHA retrofit kit for the machine and held the company harmless. The Toxic Substances Control Act (TOSCA) also has created problems. TOSCA requires chemical suppliers to provide Material Data Safety Sheets on each of the products sold. These data sheets provide generic health-and-safety information on industrial and proprietary ingredients in the product. McDonnell–Douglas has found that some of its smaller suppliers are unable or unwilling to prepare the required information. Consequently, the corporation no longer obtains chemical products from these vendors. Their reasoning is that TOSCA eventually will require that this information be available to workers and to the ultimate disposal contractor. McDonnell–Douglas believes that it is not its responsibility to relieve the vendor of this task.

McDonnell–Douglas predicts decreasing OSHA-related costs in the future (capital costs are largely past for the firm), but possibly increasing environmental costs due to RCRA, TOSCA, and proposed changes in the Clean Air Act. The Clean Air Act could prove restrictive for future expansion of painting operations because of solvent-carrier releases to the atmosphere. Solventless spray painting may be required for future production surges.

McDonnell–Douglas also was asked about the impact of OSHA and EPA on its surge or mobilization capability. The firm foresees some environmental problems, but does not expect them to be insurmountable. The Company believes that EPA standards could and would be met. It also believes that OSHA standards are cost effective, especially for new employees hired during production surge. They are well aware of the high accident rate experienced during the first 90 days or so of employment in American industry. McDonnell–Douglas also supports OSHA standards during surge to protect its existing aging work force. With age, workers are increasingly placed on limited duty for various health-related reasons (such as no heavy lifting), and

this practice results in a loss of flexibility for the work force. Therefore, the company desires to protect its skilled employees as needed.

E

GENERAL DYNAMICS, ELECTRIC BOAT DIVISION, GROTON, CT

THE ELECTRIC BOAT DIVISION of the General Dynamics Corporation in Groton, CT, is the largest builder of submarines for the US Navy. Electric Boat is building the New TRIDENT class Fleet Ballistic Missile Submarines and the SSN 688 Class Fast Attack Submarines. At present, the facility is operating near capacity. Production could not be significantly increased (doubled), because of a lack of ability to expand the size of the facility at the existing location on the Thames River.

The Director of Industrial Relations for Electric Boat Division, with a staff of 30 people, is responsible for health-and-safety matters. The Director of Facilities, with a staff of three is responsible for environmental affairs. The number of personnel in these two offices has remained relatively stable since 1975. (See appendix F for information on the office of the Supervisor of Shipbuilding at Groton, CT. Appendix G also contains views of another shipbuilder.)

Information on new OSHA and EPA legislation or changes to existing laws is obtained from the *Federal Register*, the Shipbuilders Council of America, and other sources. Electric Boat Division does not lobby per se, but works through the Shipbuilders

Council of America to effect legislation. This procedure does not preclude the firm's representatives from providing information to or discussing matters with members of the Congress or their staffs.

Meeting EPA and OSHA regulations has involved considerable increased costs in terms of time and money. Since the Electric Boat Division's facility is 100 percent Government owned, these costs are included in the cost of ships and are passed on to the Government. These costs involve facility increases, personnel increases discussed above, consultant costs, legal fees, and additional paperwork that permeates the system. OSHA inspectors assigned to Electric Boat Division originally had little or no experience in the industry, resulting in many unreasonable or trivial citations. In the case of staging, compliance with OSHA requirements could create increased hazard. A $250,000 citation was assessed to Electric Boat Division, but this citation subsequently was reduced to $88,000. Another citation involving two deaths was decided in favor of the company. As time progressed, the relationship between OSHA and Electric Boat Division has improved because of improved dialogue, education of inspectors, and change of administration.

Costs for OSHA and EPA regulations are included in overhead and operating costs. Identification of all costs is not easy, and information on such costs is not available; however, estimated costs of more than $40 million easily are identified (including $26 million per year for meeting lead standards).

Electric Boat Division is concerned with impending OSHA regulations. New nickel and chromium standards now being prepared may cost as much as the lead standards. Again, these costs will be passed on to the customer—the government. The company recognizes that OSHA is here to stay and that, even if the Government abolished OSHA, the courts still would have the task of resolving claims and disputes. Also, some State laws and maritime laws now are more stringent than OSHA requirements. Waiver or relaxation of EPA and OSHA standards during industrial mobilization would raise questions of legal responsibility for any consequences arising from relaxed or waived standards. If serious incidents similar to the asbestos or noise problems would occur as a result of waived or relaxed standards, would

the Government grant immunity to the contractor or assume responsibility for any claims? Industry desires that common sense be used in development and enforcement of regulations, with a minimum of paperwork and reporting.

F

SUPERVISOR OF SHIPBUILDING, GROTON, CT

THE SUPERVISOR OF SHIPBUILDING at Groton, CT, is located at the Electric Boat Division of the General Dynamics Corporation facility at Groton, CT. The supervisor's office, which is responsible for administration of shipbuilding and design contracts between the US Government and General Dynamics, employs approximately 450 military and civilian personnel. The supervisor's office has three people in the safety office reporting to security.

The safety office is responsible for monitoring the contractor; it is not responsible for evaluating or enforcing contractor compliance with EPA and OSHA regulations. The safety office maintains a neutral position between the contractor, EPA, and OSHA. It is concerned with the health and safety of Government employees in the facility and works actively with the contractor to correct any deficiencies. Since the supervisor's office is located in the Electric Boat facility, its Electric Boat Division is responsible for taking all necessary actions to meet EPA and OSHA regulations within the spaces occupied by the supervisor.

G

NORFOLK NAVAL SHIPYARD PORTSMOUTH, VA

THE RESEARCH TEAM WAS BRIEFED on 11 February 1983 by selected shops and work centers at the Norfolk Naval Shipyard, Portsmouth, VA. Through these meetings and a tour of the facilities, the team observed operations and talked with management personnel and members of the work force.

Throughout the day, team members found that this Government-owned-and-operated facility is making an obviously sincere effort to comply with all safety-and-health regulations. This effort was evidenced by management and labor force. In some areas, however, a "missing link" seemed to exist between safety regulations and common sense. Being a Government facility, the shipyard is subjected not only to OSHA and EPA regulations, but also to regulations imposed by DOD and the Naval Sea Systems Command. In many cases, requirements of the latter two organizations are more demanding in time and money, and duplicative in nature. According to one management official, these additional requirements, above those placed on industry by OSHA and EPA, make the shipyard nearly noncompetitive for some jobs.

Concerning equipment standards established by OSHA and EPA, the research team felt that the modern equipment, built to meet OSHA and EPA standards, is more efficient. In many cases, however, retrofits are available for older equipment that meets OSHA and EPA standards, and is much less costly. (This point was felt to be significant as an industrial mobilization issue.)

The safety and health of the labor force are major concerns of the shipyard. As such, in discussions of industrial mobilization true concern justifiably was expressed, based on history. The US Navy paid more than $170 million in workmen's compensation during 1982. Of this amount, nearly 90 percent of the claims were for accidents or events that had occurred in previous years; 80 percent of the injuries at the shipyard occurred to people with less than five years of experience; and 75 percent of the injuries occurred to people who had worked for a supervisor less than one week. Given these data, the reluctance to request OSHA and EPA waivers during a surge or industrial mobilization effort is understandable.

Specifically addressing the industrial mobilization issue, several observations were made. **First,** the large amount of paperwork required by OSHA and EPA would be deferred, but recordkeeping would be maintained. **Second,** if the shipyard had to go to three shifts instead of one, supplies of personal protective equipment as required by OSHA would be inadequate; resultant EPA standards might be violated because of the increased tempo. **Third,** finding the necessary skilled people and educating them concerning available machinery and procedures would be a major problem; also a major problem would be hazards associated with placing women in many of the positions vacated by men going to war.

In summary, the research team felt that the industrial mobilization issue has not been adequately addressed by the shipyard. In peacetime, the shipyard is doing a superb job of complying with OSHA and EPA standards. But no plans exist for industrial mobilization.

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